

**Case Report**

# Survival from cardiac arrest due to sushi suffocation

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**BACKGROUND:** Sushi suffocation is relatively uncommon, and it is an unignorable cause of sudden death; however, no reports on sushi suffocation have been published.

**METHODS:** A 60-year-old man was referred to our hospital for post resuscitative intensive care. He had choked on sushi and collapsed in the dining room of a mental hospital. A nursing assistant summoned a physician who attempted to extract the sushi. External cardiac massage was initiated after 7 minutes had elapsed and followed by endotracheal intubation. Return of spontaneous circulation was achieved after 7 minutes of resuscitation. A bronchoscopy demonstrated a large amount of shari in the trachea and right bronchus, which was removed with alligator forceps and a wire basket.

**RESULTS:** Neurological recovery was evident on day 2 of admission. He was transferred back to the mental hospital with no neurological complications.

**CONCLUSION:** Emergency physicians should consider sushi suffocation, including its clinical features and management.

**KEY WORDS:** Food suffocation; Sushi; Cardiopulmonary arrest

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## INTRODUCTION

Japanese cuisine, particularly sushi, is very popular throughout the world due to its taste, artistic quality, and health benefits.

Sushi consists of rice cooked with vinegar (*shari*) combined with other ingredients (*neta*) such as raw fish or other seafoods. The chef fills the *shari* into a small rectangular box held between the palms, which can be eaten in a mouthful.

Food suffocation is relatively uncommon, but it is an unignorable cause of sudden death;<sup>[1,2]</sup> however, no reports have been published on sushi suffocation.

Here, we report an alarming case of cardiac arrest due to sushi suffocation that was successfully treated, highlighting the clinical features and management of the case.

## CASE REPORT

A 60-year-old man with stable schizophrenia was admitted to a mental hospital for 11 years, and he was referred to our hospital for post-resuscitative intensive care. He had choked on sushi and collapsed in the dining room at the mental hospital. A nursing assistant summoned a physician, who attempted to extract the sushi. Cardiopulmonary arrest and pulseless electrical activity were confirmed by the physician. External cardiac massage was initiated after 7 minutes had elapsed and followed by endotracheal intubation. Return of spontaneous circulation was obtained after 7 minutes of resuscitation without administration of epinephrine.

On presentation, his Glasgow Coma Scale score was 3/15 after endotracheal intubation. Vital signs were as follows: body temperature, 35.4 °C; blood

pressure, 145/74 mmHg; heart rate, 105/min; and oxygen saturation, 100%. The patient was manually ventilated with 10 L/min of oxygen. His pupils were 3.0 mm, equal in size, and round. Auscultation revealed crackles in bilateral lungs. Other findings were unremarkable.

Laboratory tests revealed a normal white blood cell count (6 200 cells/ $\mu$ L) and high D-dimer levels (32.6  $\mu$ g/mL). Arterial blood gas analysis during oxygen administration showed the following: pH 7.413,  $PCO_2$  39.5 mmHg,  $PO_2$  269.5 mmHg,  $HCO_3$  24.6 mmol/L, and oxygen saturation 100%.

Electrocardiography showed normal sinus rhythm, and multiple circular shadows in the bilateral pulmonary hilar region were observed on a chest radiograph, indicating a history of tuberculosis (Figure 1). A bronchoscopy demonstrated a large amount of *shari* in the trachea and right bronchus (Figure 2), which was removed with alligator forceps and a wire basket.

The patient was admitted to the critical care unit for post-resuscitative care. Additional treatment of

sulbactam/ampicillin for aspiration pneumonia was initiated. Therapeutic hypothermia was not initiated because its effect on cardiac arrest caused by airway obstruction has not yet been confirmed; therefore, normothermia was maintained.

On day 2 of admission, bronchoscopy demonstrated a clear trachea and bronchus. Neurological recovery was evident, and the patient was extubated. He was transferred back to the mental hospital, with no neurological complications.

## DISCUSSION

Our case emphasizes that emergency physicians should consider sushi suffocation including its clinical features and management. Between 2008 and 2010, a total of 4 136 cases of suffocation were brought to hospitals in Tokyo and its environs. Seventy-six cases including 6 cases of cardiopulmonary arrest due to sushi suffocation have been reported, showing the fifth highest prevalence among food suffocation cases (Consumer Affairs Agency, Government of Japan. The analysis of food suffocation is available online at: <http://www.caa.go.jp/safety/index2.html>. Mochi (406 cases), a Japanese rice cake made of glutinous rice, was the leading cause of food suffocation in this survey, followed by rice (260), candy (256), and bread (238). However, the mortality rate from sushi suffocation is the highest at 7.9% followed by rice (14 cases, 5.4%), and bread (12 cases, 5.0%). Sushi suffocation has the most serious complications because the *shari* gradually and silently moves into the trachea and occludes the airway, whereas it cannot be removed immediately with a finger sweep, unlike that with candy, mochi, or bread suffocation.

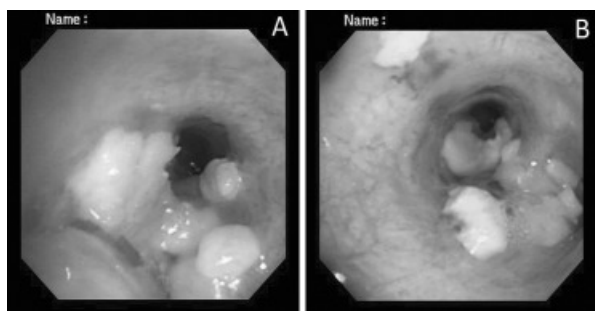
The management of sushi suffocation requires not only immediate basic life support but also removal of the *shari* under bronchoscopy to treat aspiration pneumonia and improve oxygenation. The most useful instruments for removal are alligator forceps and a wire basket.<sup>[3]</sup>

Wick et al<sup>[4]</sup> reported that 61% of the patients with food asphyxiation have a history of neurological or psychiatric disorders such as dementia, schizophrenia, Alzheimer disease, or atherosclerotic cerebrovascular disease.

Although this patient was admitted to a mental hospital for 11 years, his psychological condition was stable and swallowing ability was not affected. However, this patient may have delayed cough and gag reflexes due to his psychiatric illness.



**Figure 1.** Chest radiography showing multiple round shaped circular shadows in the bilateral pulmonary hilar region.



**Figure 2.** Bronchoscopy image showing that the trachea (A) and right bronchus (B) were occluded with a large amount of *shari*.

In conclusion, the mortality rate of patients with sushi suffocation is the highest among the patients with food suffocation. The management of sushi suffocation requires not only immediate basic life support but also removal of the *shari* under bronchoscopy to treat aspiration pneumonia and improve oxygenation. People in every country may consume sushi differently; therefore, further studies are required to investigate the clinical features and evaluate the management of sushi suffocation in different countries.

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**Contributors:** TH, NK, HK, and YK, treated the patient. TH wrote the manuscript. KK revised and edited the manuscript. All authors read and approved the final manuscript.

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